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WHAT IS CLAIMED IS:

- 1 1. An insert for a bat comprising:
2 a substantially tubular body extending along a longitudinal axis, the body
3 having internal and external surfaces; and
4 at least one sheet having a proximal edge, a distal edge, and first and
5 second side edges, the at least one sheet coupled to at least a portion of one of the
6 internal and external surfaces of the body such that the first and second edges each
7 extend from the proximal edge to the distal edge along a path that is substantially non-
8 parallel with the longitudinal axis.
- 1 2. The insert of claim 1 wherein the first edge overlaps the second edge
2 along at least a portion of the path to form an overlapped seam.
- 1 3. The insert of claim 1 wherein the first edge is positioned adjacent to the
2 second edge along at least a portion of the path to form a non-overlapped seam.
- 1 4. The insert of claim 1 wherein the at least one sheet includes first and
2 second sheets with the second edge of the first sheet overlapping the first edge of the
3 second sheet and the second edge of the second sheet overlapping the first edge of the
4 first sheet.
- 1 5. The insert of claim 1 wherein the at least one sheet includes first and
2 second sheets with the second edge of the first sheet is positioned adjacent to the first
3 edge of the second sheet and the second edge of the second sheet is positioned adjacent
4 to the first edge of the first sheet.
- 1 6. The insert of claim 4 wherein the body has a periphery and wherein the
2 first and second sheets at least partially overlap to substantially cover the periphery.

1 7. The insert of claim 1, wherein the path taken by at least one of the first
2 and second side edges between the proximal edge and the distal edge is selected from
3 the group consisting of helical, sinusoidal, convoluted, jagged, curved, irregular and
4 combinations thereof.

1 8. The insert of claim 1 wherein the sheet comprises a material selected
2 from the group consisting of a fiber matrix composite, a metal matrix composite, a
3 carbon matrix composite, a rubber, a urethane, an elastomer and combinations thereof.

1 9. The insert of claim 1 wherein the body has a periphery, wherein the first
2 edge contacts the body, and wherein the sheet wraps about periphery of the body such
3 that at least a portion of the sheet overlaps itself.

1 10. The insert of claim 1 wherein the sheet has greater strength in a
2 peripheral direction than in a longitudinal direction.

1 11. The insert of claim 1 wherein the body includes a proximal portion and a
2 distal portion, and wherein at least one longitudinally extending slit is formed in the
3 proximal portion of the body.

1 12. A ball bat comprising:

2 a substantially tubular frame extending along a longitudinal axis having a
3 handle portion and a primary hitting portion;

4 a substantially tubular body coaxially aligned with the hitting portion of
5 the frame; and

6 at least one sheet having a proximal edge, a distal edge, and first and
7 second side edges, the sheet coupled to at least a portion of one of the hitting portion of
8 the frame and the body such that the first and second edges each extend from the
9 proximal edge to the distal edge along a path that is substantially non-parallel with the
10 longitudinal axis.

1 13. The ball bat of claim 12 wherein the first edge overlaps the second edge
2 along at least a portion of the path to form an overlapped seam.

1 14. The ball bat of claim 12 wherein the first edge is positioned adjacent to
2 the second edge along at least a portion of the path to form a non-overlapped seam.

1 15. The ball bat of claim 12 wherein the hitting portion includes an inner
2 surface and an outer surface, and wherein the at least one sheet is coupled to the inner
3 surface of the hitting portion.

1 16. The ball bat of claim 12 wherein the hitting portion includes an inner
2 surface and an outer surface, and wherein the at least one sheet is coupled to the outer
3 surface of the hitting portion.

1 17. The ball bat of claim 12 wherein the at least one sheet includes first and
2 second sheets with the second edge of the first sheet overlapping the first edge of the
3 second sheet and the second edge of the second sheet overlapping the first edge of the
4 first sheet.

1 18. The ball bat of claim 12, wherein the path taken by at least one of the
2 first and second side edges between the proximal edge and the distal edge is selected
3 from the group consisting of helical, sinusoidal, convoluted, jagged, curved, irregular
4 and combinations thereof.

1 19. The ball bat of claim 12 wherein the sheet comprises a material selected
2 from the group consisting of a fiber matrix, a rubber, a urethane, an elastomer and
3 combinations thereof.

1 20. The ball bat of claim 12 wherein the hitting portion has an inner surface,
2 wherein the first edge contacts the inner surface of the hitting portion, and wherein the

3 sheet covers at least of a portion of the inner surface such that at least a portion of the
4 sheet overlaps itself.

1 21. The ball bat of claim 12 wherein the body includes a proximal portion
2 and a distal portion, and wherein at least one longitudinally extending slit is formed in
3 the proximal portion of the body.

1 22. A substantially tubular insert for a bat wherein the insert extends along a
2 longitudinal axis, the insert comprising:

3 a plurality of layers, each layer forming at least part of a tubular shape
4 and connected to at least one of the other layers, each layer having a proximal edge, a
5 distal edge, and first and second side edges, the first and second edges of each layer
6 extending from the proximal edge to the distal edge along a path that is substantially
7 non-parallel with the longitudinal axis.

1 23. The insert of claim 22 wherein each layer is bonded to at least one other
2 layer, and wherein each layer overlaps at least a portion of the at least one other layer.

1 24. The insert of claim 23, wherein each layer includes a plurality of fibers,
2 and wherein the fibers of each layer are oriented in substantially the same direction.

1 25. The insert of claim 24, wherein the plurality of layers includes at least
2 first and second sets of layers, wherein the fibers of the first set of layers are orientated
3 at between 0 and 90 degrees relative to the longitudinal axis, and wherein the fibers of
4 the second set of layers are orientated at between 90 and 180 degrees relative to the
5 longitudinal axis.

1 26. The insert of claim 25 wherein the first set of layers are bonded to each
2 other, wherein the second set of layers are bonded to each other, and wherein one of
3 the first set of layers is bonded to one of the second set of layers.

1 27. The insert of claim 25 wherein each of the first set of layers is bonded to
2 at least one of the second set of layers, and wherein the second set of layers are spaced
3 apart from each other.

1 28. The insert of claim 25 wherein the layers of the first and second set of
2 layers are bonded in a random order.

1 29. The insert of claim 25 wherein the fibers of the first set of layers are
2 orientated at between 65 and 85 degrees relative to the longitudinal axis, and wherein
3 the fibers of the second set of layers are orientated at between 95 and 115 degrees
4 relative to the longitudinal axis.

1 30. The insert of claim 22, wherein the path taken by at least one of the first
2 and second side edges between the proximal edge and the distal edge is selected from
3 the group consisting of helical, sinusoidal, convoluted, jagged, curved, irregular and
4 combinations thereof.

1 31. The insert of claim 22 wherein the layers are comprised of a material
2 selected from the group consisting of a fiber matrix composite, a metal matrix
3 composite, a carbon matrix composite, a rubber, a urethane, an elastomer and
4 combinations thereof.

1 32. The insert of claim 22 wherein the plurality of layers includes at least six
2 layers.

1 33. The insert of claim 22 wherein the majority of the plurality of layers has
2 substantially the same length between the proximal edge to the distal edge, when
3 measured parallel to the longitudinal axis.

1 34. The insert of claim 22 wherein each layer has a thickness between 0.003
2 inches and 0.015 inches.

1 35. The insert of claim 22 wherein the majority of the plurality of layers
2 substantially overlap one of the other layers.

1 36. The insert of claim 22 wherein the first and second edges of each layer
2 of the plurality of layers are spaced apart from the first and second edges of the other
3 layers of the plurality of layers.

1 37. The insert of claim 22 wherein at least one of the plurality of layers has
2 its first edge at least partially overlapping its second edge to form a single-layer
3 overlapped seam.

1 38. The insert of claim 22 wherein at least one of the plurality of layers has
2 its first edge positioned adjacent to its second edge to form a single layer non-
3 overlapped seam.

1 39. A method of manufacturing a composite insert for a ball bat, comprising:
2 obtaining an elongate, generally cylindrical mandrel having a periphery
3 and extending along a longitudinal axis;

4 forming at least first and second layers of composite material into a
5 predetermined shape, each layer having a proximal edge, a distal edge, and first and
6 second side edges;

7 wrapping the first layer about at least a portion of the periphery of the
8 mandrel such that the first and second edges of the first layer each extend from the
9 proximal edge to the distal edge along a path that is substantially non-parallel with the
10 longitudinal axis; and

11 wrapping the second layer about at least a portion of the first layer such
12 that the first and second edges of the second layer each extend from the proximal edge
13 to the distal edge along a path that is substantially non-parallel with the longitudinal
14 axis; and

15 removing the mandrel from the at least first and second layers.

1 40. The method of manufacturing an insert of claim 39, further comprising
2 the step of adjusting the second layer so that the first and second edges of the second
3 layer do not overlap any of the first and second edges of the first layer.

1 41. The method of manufacturing an insert of claim 39, further comprising
2 the step of wrapping at least one additional layer onto the second layer such that the
3 first and second edges of the additional layer each extend from the proximal edge to the
4 distal edge along a path that is substantially non-parallel with the longitudinal axis.

1 42. The method of manufacturing an insert of claim 39, further comprising
2 the steps of:
3 wrapping a shrinkable material about the at least first and second layers;
4 curing the insert at a predetermined temperature; and
5 removing the shrinkable material.

1 43. The method of manufacturing an insert of claim 39, further comprising
2 the steps of:
3 providing a substantially tubular frame having a handle portion and a
4 primary hitting portion; and
5 inserting the insert into the hitting portion of the frame.

1 44. The method of manufacturing an insert of claim 43, further comprising
2 the steps of:
3 inserting a bladder into the inside diameter of the insert; and
4 pressurizing the bladder.

1 45. The method of manufacturing an insert of claim 44, further comprising
2 the steps of heating the insert and the frame.

1 46. The insert of claim 39 wherein at least one of the first and second layers
2 has its first edge at least partially overlapping its second edge to form a single-layer
3 overlapped seam.